

**COMMENTS OF THE
COMMISSION ON THE FUTURE OF MOBILITY**

In the matter of:
America's Supply Chains and the Transportation Industrial Base,
Docket No. DOT-OST-2021-0106

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**Re: America's Supply Chains and the Transportation Industrial Base, Docket
No. DOT-OST-2021-0106**

Dear Mr. Endorf:

The Commission on the Future of Mobility (CFM)¹ appreciates the opportunity to provide input to the U.S. Department of Transportation (USDOT) in response to the above-captioned Notice of Request for Information (RFI). We are writing to strongly encourage investment in the digital transformation of the nation's freight system. By investing in data-driven technology solutions, government and industry partners can mitigate supply chain risks while dramatically reducing freight sector emissions and the nation's dependence on fossil fuels.

These comments highlight current challenges, explain the benefits of digital transformation and the work CFM is undertaking, and provide recommendations for action by USDOT and its partners at the state and local levels to promote the digital transformation of the freight sector.

I. INTRODUCTION AND SUMMARY

COVID-19 exacerbated freight transport and supply chain vulnerabilities that have existed for years. Today's freight sector is highly fragmented, with low transparency, and can be reliant on manual processes. In short, there is a lack of understanding of where goods are along their journey. Many firms, large and small, maintain their data in spreadsheets, paper-based documentation is still widespread, and determining whether a shipment is delayed or late often requires a phone call to check on progress. Operational freight data is not captured or visible, meaning supply chain risks cannot be proactively managed. These factors create a lack of understanding of where goods are along their journey.

¹ The Commission on the Future of Mobility (CFM) is a global coalition shaping more equitable and sustainable policy solutions that leverage technology to improve the movement of people and goods around the world. CFM is an initiative of SAFE, <https://secureenergy.org>. For more information, visit <http://futuremobilitycommission.org>.

As a result, an estimated 20% of all U.S. trucking miles today are empty vehicles, with many companies underreporting.² At sea, globally, on average 20% of containers are transported empty.³ In addition, freight capacity reductions due to congestion at ports, rail lines, roads, and warehouses, is estimated at 25% for trucking alone.⁴ The United States needs to optimize the freight system to make better use of existing freight capacity and meet ambitious emissions reduction targets.

Driving improvements through technology. Digital transformation can be enabled through reliable, machine-readable operations and location data that can be shared across the freight value chain. This will improve route optimization and translate to more efficient port, trucking, and rail operations while reducing carbon emissions and fossil fuel use by minimizing idling time and empty miles.

Increased transparency that would enable seamless communication and proactive management is possible with technologies that exist today. For example, employing current technologies such as phone applications, GPS (global positioning system) tracking, bar code scanning, and RFID tags would produce near real-time information about where goods are along their route. These data can be structured to be machine-readable, allowing for two-way communication among stakeholders and supporting proactive management, both key to optimizing the system. This approach to leveraging data to improve operational processes is what CFM defines as “freight digital transformation.”

Investing in digital freight infrastructure means more efficient and sustainable goods movement; support for small, medium, and large businesses; and a more resilient system and workforce. Access to reliable, near real-time data has the potential to:

- Encourage the shift from higher emitting freight modes to lower emitting freight modes;
- Ensure resiliency against threats from climate change;
- Reduce the dependence of our economy on fossil fuels by lowering the economy’s oil intensity, or barrel of oil needed per dollar of GDP;
- Provide information to allow vessels and/or vehicles to run at more fuel-efficient speeds (e.g., slow steaming maritime ships to make their digital appointment at a port); and
- Reduce empty miles traveled and make more efficient use of existing system capacity, among other benefits.

² ATRI. (2020, Nov). *An Analysis of Operational Costs of Trucking: 2020 Update*, p. 10. <https://truckingresearch.org/wp-content/uploads/2020/11/ATRI-Operational-Cost-of-Trucking-2020-FINAL.pdf>.

³ GreenPort. (2014, May 4). *Reducing Empty Container Costs*. <https://www.greenport.com/news101/Products-and-Services/reducing-empty-container-costs>

⁴ Smartrak, (2021). *The Costs of Fleet Idle Time*. <https://smartrak.com/the-costs-of-fleet-idle-time/>.

Together, these improvements will create a more resilient supply chain and position the United States as a leader in freight digital transformation globally. *Given the uncertain timeline for a full transition to low and net zero emission freight vehicles, USDOT should position operational efficiency as a primary path to near-term emissions reductions.*

Recommendations. We encourage the Biden Administration to invest in the digital transformation of freight to maximize existing capacity. In the near term, USDOT must focus on the digital transformation of the freight sector and the standardization of data formats and processes. Specifically, we recommend that USDOT do the following:

- Promote standardization of operational data;
- Leverage subsidies to achieve digital transformation outcomes;
- Support international, national, state, and local collaboration; and
- Ensure digital transformation does not crowd out smaller firms and owner-operators.

Even as the freight sector transitions to low and net zero emission vehicles, USDOT must act now by investing in a digital transformation that enables collaboration and data sharing across the supply chain, allows small- and medium-sized businesses to compete, and prioritizes operational efficiencies that reduce emissions.

II. THE FREIGHT SECTOR – AND PORTS IN PARTICULAR – FACE SIGNIFICANT CHALLENGES.

The freight sector is in crisis, with rising demand side expectations coupled with supply side limitations, leading to severe congestion and disruptions. Short and inflexible delivery windows and a rapidly expanding e-commerce sector are confronted by significant challenges on the supply side. Supply side capacity issues and inefficient supply chain networks are exacerbating issues such as container and trucking shortages as well as port congestion. Globally, there is an unprecedented pile up of containerships, with more than 690 vessels currently waiting for berth space.⁵ Earlier this month, it was reported that major U.S. retailers are chartering private cargo ships – at huge expense – to avoid severe backlogs at major U.S. ports.⁶ The COVID-19 pandemic has exposed the vulnerabilities of extended and complex value chains, leading to new public understanding of the critical role of our supply chains and freight sector.

⁵ As of October 4th 2021, Kuehne & Nagel (2021, Oct 18). *Seaexplorer*. <https://seaexplorer.com/>.

⁶ Nassauer, S. & C. Paris. (2021, Oct 10). Biggest U.S. Retailers Charter Private Cargo Ships to Sail Around Port Delays, *The Wall Street Journal*, Business. <https://www.wsj.com/articles/biggest-u-s-retailers-charter-private-cargo-ships-to-sail-around-port-delays-11633858380>.

A. Operational Inefficiencies in the Freight Network Lead to Unnecessary Emissions and Congestion.

Container shortages and driver shortages, exacerbated by COVID-19, strain the system, and underscore the need to make the best use of limited resources. The strain is partially due to trade imbalances – Asian countries are net exporters to North America and Europe – and domestic variations in import/export markets. However, there are at least three other key factors at play:

Lack of location understanding. Despite the rising availability of digital information, there is a lack of understanding about where goods are along their journey. Today's freight sector is highly fragmented, has low transparency, and is often reliant on manual processes. Many firms of all sizes store key data on spreadsheets, and paper-based documentation is still widespread. It often requires a phone call to determine whether a shipment is delayed. Operational freight data is not captured or visible, meaning supply chain risks cannot be proactively managed.

Rising demand and longer distances. Freight's share of global transportation emissions is increasing. Globalized commerce requires transporting goods over longer distances, which leads to more fuel consumption. Freight demand is expected to more than double by 2050.⁷ Over this period, growth in demand is projected to increase freight-sector emissions by 22 percent.⁸

Empty miles. There is a significant amount of waste in freight. One of every three shipping containers moved globally is empty, costing the industry \$20 billion per year.⁹ Many trucks on roads are empty as well. The percent of empty trucking miles in the U.S. increased from 16.6% of total miles in 2018 to 20.1% in 2019.¹⁰ For private fleets, that percentage is even higher, growing from 26% of all miles in 2017 to 33% by 2019.¹¹ These empty or half-empty trucks and shipping containers are contributing to congestion, emissions, and delays. Better information would mean better matching of loads to trips, increasing dual moves and reducing empty miles.

⁷ International Transport Forum. (2021). *ITF Transport Outlook 2021*, p. 14, https://read.oecd-ilibrary.org/transport/itf-transport-outlook-2021_e8125f08-en#page1.

⁸ International Transport Forum. (2021). *ITF Transport Outlook 2021*, p. 15, https://read.oecd-ilibrary.org/transport/itf-transport-outlook-2021_e8125f08-en#page1.

⁹ BCG. (2015, Nov 5). *Think Outside Your Boxes: Solving the Global Container-Repositioning Puzzle*. <https://www.bcg.com/publications/2015/transportation-travel-logistics-think-outside-your-boxes-solving-global-container-repositioning-puzzle>.

¹⁰ ATRI. (2020, Nov). *An Analysis of Operational Costs of Trucking: 2020 Update*, p. 10. <https://truckingresearch.org/wp-content/uploads/2020/11/ATRI-Operational-Cost-of-Trucking-2020-FINAL.pdf>.

¹¹ ATRI. (2020, Nov). *An Analysis of Operational Costs of Trucking: 2020 Update*, p. 11. <https://truckingresearch.org/wp-content/uploads/2020/11/ATRI-Operational-Cost-of-Trucking-2020-FINAL.pdf>.

Increased Emissions and Oil Use. To meet ambitious emissions reduction targets, government and industry must work together to continue the process of transitioning to zero emission vehicles and fueling infrastructure while optimizing the freight system. Despite the unequivocal necessity of achieving net zero emissions, tackling the emissions problem by focusing solely on the fuel side of the equation will not allow the United States to meet its commitments under the Paris Agreement to cut greenhouse gas emissions in half by 2030. The uncertain time horizon for a full transition to low and net zero emission freight vessels and vehicles means that USDOT should position operational efficiency as a primary path to near-term emissions reductions. Investing in freight sector digital transformation provides an opportunity to address emissions using technology readily available and widely used today.

Digital transformation of the freight sector will also reduce the oil intensity of the economy in terms of barrels per dollar of GDP. The country and world are experiencing the current inflationary pressures of rising oil demand and controlled supply, putting economic recovery in jeopardy. The use of digital freight technology will reduce this dependence so changes to the price of oil will be less impactful for businesses and consumers.

B. The Freight Sector Has Generally Been Resistant to Digitize.

For several reasons, the freight sector has generally been slow and resistant to digitize. Delivering a product to a customer can involve more than a dozen companies and myriad electronic and paper documents. The sector recognizes the challenge – only 28% of transportation and logistics companies see themselves as ‘advanced’ when it comes to digitization, as compared to 41% of automotive companies and 45% of electronics companies.¹² Of the nearly 5,000 ports worldwide, 80% rely on manual data management tools such as spreadsheets and paper-based processes.¹³ The slow and uncoordinated approach to technology adoption persists due to several challenges including:

- Companies are often hesitant to share data due to concerns about losing competitive advantage or privacy concerns. Customer and systems data are an important part of a freight business’ knowledge resources – without an obligation to share relevant and limited parts of this data to benefit the wider system, firms will default to sharing as little as possible with any third party. Additionally, some operational data may also include personal data, which requires information infrastructure and administrative processes to manage.
- Information asymmetries that benefit some supply chain operators create a bias against changes that would otherwise benefit the entire sector.
- There is a lack of protocols and/or oversight.

¹² ARC. (2020, Mar 24). *What is Digitization, Digitalization, and Digital Transformation?*. <https://www.arcweb.com/blog/what-digitization-digitalization-digital-transformation>.

¹³ The Maritime Executive. (2021, February 5). *Majority of Global Ports Are Missing Out on Digitalization*. The Maritime Executive. <https://www.maritime-executive.com/article/majority-of-global-ports-are-missing-out-on-digitalization>.

- The cost and effort needed to change how business is conducted present a major hurdle. This transition will take federal leadership, regulation, mandates, incentives, and other support.

Indeed, the supply chain instability and surges in demand caused by the COVID-19 pandemic highlighted the weaknesses of existing, antiquated systems of freight operations, and the critical need to share data both along and across the supply chain. There has been a corresponding upswell of digital freight brokers, electronic load boards, online marketplaces, and other digital systems streamlining the process from tender to delivery. However, a divide exists between major players who have the financial capabilities to realize the benefits of digitalization and other small and medium enterprises with fewer resources.

Ad hoc innovation in supply chain information systems has also created an environment with few standards, or inconsistent/insufficient adoption of what few standardized systems and processes exist. A lack of leadership around inter-system communication protocols limits the ability to truly optimize freight transport operations. Thus, breaking down freight and modal silos, and finding ways to increase collaboration between companies, would unlock huge potential to optimize resources.

III. DIGITAL TRANSFORMATION WILL PROMOTE FREIGHT SECTOR EFFICIENCY, SUSTAINABILITY, AND RESILIENCY.

With leadership from USDOT, the digital transformation of the nation's freight system has the potential to be a win-win for the public and private sectors. Acceleration of freight digitalization has the potential to meaningfully reduce environmental and direct business costs by increasing visibility along the supply chain. With uncertain timelines attached to the transition of all modes of freight to net zero emission vehicles, government and industry need to take coordinated action to achieve operational efficiency gains that reduce emissions in the freight sector. Investing in and leveraging existing digital technologies and data – the digital transformation of freight – can unlock these efficiency gains in the next five to ten years.

A. Digital Transformation Can Help Mitigate Major Risks to Resilience.

Question 4 of the RFI highlights major risks to resilience within the freight and logistics sector. These risks will only increase as global freight movements become increasingly complex due to more frequent extreme weather, climate disruption, and other unpredictable events. As a result, there will be an increasing need for near real-time information sharing and data handling to enable dynamic scheduling and operations. Rising demand has pushed parts of the system over design capacity. Enhanced visibility through better data collection and sharing of those data can enable operators and facilities to respond and adapt to disruptions with near real-time information. When there are delays in this fast-paced and interconnected system, early insights on late or delayed deliveries allow for quick mitigation and decision making. A lack of location understanding also affects the ability to mitigate national security risks. With better data, it is

easier to identify systemic shortcomings and address bottlenecks or other points of stress within the system.

B. Digital Transformation Will Promote Climate Resiliency.

Electrification can drive progress towards meeting the nation's carbon emissions reduction goals. Efforts such as additional state level adoption of the Advanced Clean Truck (ACT) rule based on the California example, as well as supporting the Biden Administration's Executive Order targets for electric vehicle adoption, are critical elements to secure the necessary carbon reduction that can be achieved through electrification. However, electrification alone will not allow the nation to achieve its long and mid-term goals. For example, transitioning the global maritime sector to new hardware and upgraded vessels is unlikely to happen in the short term. Digital transformation, on the other hand, uses technology available today to reduce emissions by (1) making better use of existing freight capacity and (2) enabling the availability of near real-time data to increase the reliability, and competitiveness, of more fuel-efficient modes and operations. Supported by the right policies, digital transformation in freight will provide essential, accurate data to public and private entities so they can more quickly and effectively respond to and mitigate losses associated with extreme weather events.

1. Fuel Efficiency

More fuel-efficient operations. More transparent port operations lead to reduced idling and congestion of trucks and ships at ports. Better understanding of the timing of berth availability allows ships to “slow steam” (the intentional slowing down of a vessel to reduce emissions) and optimize routing, both of which reduce emissions. Currently, vessels are served on a first-come-first-served basis, which often leads to “hurry and wait” behavior. Due to lack of information and congested ports, the world's ships annually spend 6% of their time waiting at anchor due to delays at port after traveling at high, emission-intensive speeds across the ocean.¹⁴

While a ship is required to file advance notice of its arrival with the port authorities, the port authorities have no obligation to advise whether a berth will be available at the estimated arrival time. This scenario happens every day in ports across the United States. With innovations such as virtual queuing (a system that allows users to sign up for an appointment remotely and then be placed in a virtual queue), slow steaming can be used to optimize a vessel's speed to match its arrival time to berth availability. Better communication around the availability of truck bays, scheduling tools, truck RFID tags tied to gate operating systems, and smart traffic lights can help to alleviate road congestion and avoid start-and-stop behavior. These interventions reduce vehicle idling time and improve air quality for communities living in close proximity to the port.

¹⁴ Gustafsson, A. (2019, Feb 6). Slow steaming to arrive at the right time, *Wartsila*. <https://www.wartsila.com/insights/article/slow-steaming-to-arrive-at-the-right-time>

At any time of day or night, several hundred trucks are on the move in each major port worldwide, delivering or collecting containers to and from the terminals. Traffic jams and waiting times are everyday occurrences for truck drivers. Port operations contribute to pollution in coastal urban areas and increase road transport emissions due to inefficient coordination.¹⁵ Port authorities can actively improve collaboration and port performance with better data sharing and increased transparency. Port authorities can also influence the efficiency of truck operations at the port by optimizing truck movements and arrivals using truck appointment systems.¹⁶

More fuel-efficient modes. Intermodal freight transport refers to the movement of goods using two or more modes of transport. This generally means truck, rail, maritime, air, and/or inland waterways. Currently, freight operators cannot confidently schedule modal transfers due to unreliable arrival times. This leads to significant slack time being built into scheduling movements. Although adding this time buffer when trip planning helps prevent missed connections, it drives up total costs for both shippers and carriers and reduces the competitiveness of more energy efficient modes.¹⁷ Furthermore, it leads to an overreliance on more flexible modes (trucks) over lower emitting modes (rail, maritime, inland waterways).

Better freight tracking, therefore, makes intermodal moves more reliable, enhancing the competitiveness of lower-emitting modes. With better insight and advance warning of when a ship will be ready to unload, logistics planners can improve intermodal integration (e.g. planning for a rail service to meet the ship). Facilitating the use of less carbon intensive trips by rail, barge, or sea can dramatically reduce emissions. At the same time, transportation costs are lowered for businesses and consumers when the right mode is used for the right trips.

2. Infrastructure Resiliency

Near real-time information and data handling for dynamic scheduling and operations will become even more important in a future of extreme weather events. In 2012, Hurricane Sandy caused \$2.2 billion of damage to the Port Authority of New York and New Jersey, partly because

¹⁵ Ignaccolo, M., Inturri, G., Giuffrida, N., Torrìsi, V., & Cocuzza, E. (2020). Sustainability of Freight Transport through an Integrated Approach: the Case of the Eastern Sicily Port System. *Transportation Research Procedia*, 45, pp. 177–184. <https://doi.org/10.1016/J.TRPRO.2020.03.005>.

¹⁶ Bjerkan, K. Y., & Seter, H. (2019). Reviewing tools and technologies for sustainable ports: Does research enable decision making in ports? *Transportation Research Part D: Transport and Environment*, 72, pp. 243–260. <https://doi.org/10.1016/J.TRD.2019.05.003>.

¹⁷ EPA. (2019, Mar). Intermodal for Shippers, A Glance at Clean Freight Strategies, *SmartWay Transport Partnership*. <https://www.epa.gov/sites/default/files/2019-07/documents/420f19013.pdf>.

25,000 shipping containers had to be diverted to other ports.¹⁸ Better data will help logistics companies and port authorities to quickly reroute or adapt schedules in response to a storm or flooding at the destination port. This has the potential to greatly enhance the resiliency of the freight sector to an increasingly unpredictable climate.¹⁹

The industry needs to be doing everything possible to reduce the carbon footprint of the freight sector and limit global temperature rise. The aggressive and necessary emissions targets that have been set by the Biden administration will take more than electrification alone. In the freight sector, it will take time to transition all modes to low and net zero emission vehicles. While the research and development needed to make this transition is underway, widely used sensor data and satellite-based GPS data can produce efficiency gains in the near term. Digital transformation will require harnessing that data to ensure more efficient freight operations. CFM is working with the International Transport Forum at the Organization for Economic Cooperation and Development (ITF-OECD) to model these impacts to ascertain the global and national carbon and particulate emissions that could be reduced by digitally transforming the freight sector.

C. Digital Transformation Can Help Address Shortages of Essential Cargo-Handling Equipment.

Question 2 of the RFI highlights issues with current and potential shortages of essential cargo-handling equipment such as chassis and shipping containers. The capacity limitations presented by limited available equipment can be partially reduced by using the existing stock more effectively. Beyond considerations about reducing this strain through adoption of larger capacity trailers for highway-based freight,²⁰ the primary ways to make better use of existing stock are to: (1) harness the predictive capabilities of data, and (2) increase the utilization of these assets.

Commercial forecasts are often unreliable because much of logistics planning takes place in spreadsheets. This means that logistic managers have to keep an expensive safety stock of containers and chassis in storage, so that they can quickly respond to uncertain demand. With better predictive tools, logistics planners can reduce required safety stocks. These predictive tools are available to large firms, but small and medium firms need access to these tools as well to ensure that all chassis and shipping containers are used in an optimal way.

¹⁸ Strunsky, S. (2019, Mar 30). Port Authority puts Sandy damage at \$2.2 billion, authorize \$50 million to power wash PATH tunnels, *NJ.com*.
https://www.nj.com/news/2013/10/port_authority_sandy_22billion_outlines_recovery_measures.html

¹⁹ Allianz Global Corporate & Speciality. (2021). Safety and Shipping Review 2021, p. 8.
www.agcs.allianz.com.

²⁰ Americans for Modern Transportation. (2021, Oct 4). *Letter to Cabinet Secretaries Supply Chain Solutions*. <https://americansformoderntransportation.org/project/amt-letter-to-cabinet-secretaries-supply-chain-solutions/>.

D. Digital Transformation of the Freight Sector Will Require Workforce Adaptations.

Question 7 of the RFI seeks comments regarding workforce issues. Indeed, digitalization is likely to significantly increase the labor efficiency of freight workers. This will introduce new job descriptions that may necessitate upskilling the logistics workforce in areas such as software engineering and data processing. However, this may also mean that already challenging work becomes more dangerous and difficult for workers. Fatigue is a long-standing issue for truck drivers and seafarers. Transitioning ports to 24/7 operating environments may help capacity issues, but it is necessary to ensure work is conducted safely and efficiently at all hours. This will require the creation of additional jobs to meet the needs of longer operating hours. A key challenge will be to ensure that legislative frameworks that protect and support transport workers (including the role of unions) are in harmony with digitized developments, for the benefit of workers and industry.

For truck drivers already constrained by hours-of-service requirements, better information will lead to improved working conditions. Truckers currently schedule their workday around unpredictable loading and unloading times at ports and warehouses. With better information sharing and more precise appointment scheduling, trucks can reduce their idling time, better plan and optimize their routes, and make more efficient use of their daily working hours. The follow-on effects of this would include higher quality rest for crews, an important factor in reducing fatigue. Less fatigue means improved truck driver safety and public safety. It would also mean fewer goods lost due to accident damage, leading to reduced insurance costs.

The digital transformation of freight will introduce new job descriptions that may require upskilling the workforce in areas such as software engineering and data processing. Workforce development boards are well-positioned to match workers to the freight jobs of the future. For companies that need this skilled workforce, sector partnerships can create an integrated pipeline in coordination with workforce development boards, educational institutions, and licensing authorities.

IV. CFM IS ACTIVELY WORKING TOWARD DIGITAL TRANSFORMATION SOLUTIONS.

The Commission on the Future of Mobility is identifying interventions that can ensure data is generated, standardized, and shared across modes within set timelines. CFM aims to accelerate a global digital transformation in the freight sector, creating improved efficiencies across the global system and curbing emissions growth in the sector. Data standards, data sharing, and the operational efficiency gains stemming from this standardization are necessary pre-requisites to innovation in widespread electrification, machine learning, artificial intelligence, blockchain, and other new technologies.

CFM has convened a working group of advisors and experts in the industry and is building foundational approaches to transforming the historically siloed freight sector. This work will hold the sector accountable to meeting emissions targets, setting it up for climate success. Our report on the subject, to be released in the first half of 2022, will include global and national estimates of the emissions impacts of these policy measures. We are also testing the implementation of our recommendations at the local level by coordinating a series of pilot projects connecting public and private stakeholders. These pilot projects will trial initiatives between freight operators, shippers, and intermodal facilities with two-way structured and standardized information exchanges.

V. THE DEPARTMENT OF TRANSPORTATION SHOULD ESTABLISH POLICIES TO ACCELERATE DATA STANDARDS ADOPTION.

As described above, the current fragmented adoption of information systems has led to an environment with few standards, and inconsistent or incomplete implementation of what standards there are. Lack of inter-system communication protocols also limits the ability to effectively optimize freight transport operations.

Capturing and sharing usable data across the supply chain will therefore require investment in both physical and digital infrastructure and standardized approaches to data collection and formatting. Overcoming roadblocks to data sharing across industry players requires standardized methodologies for data generation, and standardized integrations to enable interoperability. Policy measures that the federal government can take to accelerate this transition include investing in digital technologies, supporting the development of open data standards, and ensuring their widespread and consistent adoption.

A. USDOT Should Promote Standardization of Operational Data.

Consistent, validated data is required for scalable interoperability, which enables the development of higher-level processing tools that generate insights and predictions using algorithms and machine learning. Open data standards create a larger market for private sector innovations that optimize freight trips such as digital freight platforms, which enable shippers and carriers to realize greater asset utilization.

Existing and emerging standards. The logistics sector has existing data standards, primarily to support safety requirements. These include automatic identification systems (AIS) on vessels and electronic logging devices (ELD) on trucks. These are existing systems that transmit GPS data with locational and other relevant trip information. Even without investing in additional sensor technology, there are opportunities to better leverage existing systems.

Another technique which is well-established is the use of UN/EDIFACT²¹ messages, already in common use between shippers, carriers, ports, and customs, but not extended throughout the longer supply chain. There are some efforts to extend this, such as for container tracking and the adoption of electronic waybills/bills of lading, but these efforts are currently limited, regional, and voluntary. Without adoption at the national policy and widespread operational level, these initiatives risk creating a problem of interoperability, further fragmenting the supply chain. This highlights a need for a clear and coherent coordinated approach. The greatest opportunities for standardization exist in e-bill of lading standards, track and trace standards, just-in-time port call time stamps and booking standardization.

Data standardization efforts have begun to emerge, including the European Union's electronic freight transport information regulations, that will come into force in 2024. Additional data standardization efforts include China's Digital Silk Road initiatives²² that underpin its Belt and Road Initiative investments linked to supporting logistics and facilitating digital trade.

Recommendations for USDOT

Provide funding and advisory leadership on standards development. The most effective data standards are those that are easily implementable and lightweight, meaning that they require the minimum data necessary to support the identified use-case. The most successful and widely adopted open data standards have been, at least in part, industry led, such as the General Transit Feed Specification, or GTFS, which was initially incubated in partnership between TriMet in Portland and Google. Meanwhile, government-led standards development has historically been slow moving, yielding low rates of adoption.

To provide critical leadership in data standards development, USDOT should:

- Identify a neutral third-party data standards body to develop and maintain data standards to support digital transformation.
- Allocate funding to support capital development of initial standards and on-going funding streams for continued development and maintenance.

Require adopted standards to be open. To achieve the benefits of scalability, broad adoption, and (therefore) system efficiency, it is critical that freight operational data standards are open. Open standards are data specifications that are publicly available and free of cost to anyone. Open standards ensure that any organization can adopt the standard with minimal friction and ensure that organizations do not become reliant on any specific vendor.

²¹ United Nations/Electronic Data Interchange for Administration, Commerce and Transport.

²² World Economic Forum. (2018, Sept 19). *Could a Digital Silk Road solve the Belt and Road's sustainability problem?* <https://www.weforum.org/agenda/2018/09/could-a-digital-silk-road-solve-the-belt-and-roads-sustainability-problem/>

Today, many digital portals leveraged by the freight supply chain use proprietary data standards. This requires bespoke product development for any organization who wishes to share data through those products, which increases costs giving vendors undue leverage to retain contracts. Proprietary data approaches also help to perpetuate the data divide, making it more challenging for organizations to both produce data as well as to procure digital platforms to turn data into insights or enable two-way communications.

Support a data standards advisory group. While open data standards should be developed by a neutral third party, the standards need to be informed by both industry and government. USDOT can play a leadership role in convening or participating in an advisory group composed of industry data producers, data consumers, and oversight bodies. Data producers are inclusive of all entities within the freight value chain that produce operational data. Data producers include software companies that will ingest and process operations data and facilitate two-way communications. This group should be global in scope with the specific goal of informing the development and implementation of open data standards for more efficient freight operation.

Define data management and processing best practices. As freight sector stakeholders become data producers and consumers, the industry needs to develop new skill sets to responsibly manage those data. Digital transformation will have to address personal privacy, proprietary business information, and digital security.

For example, data that reflects the movements of trucks or last mile delivery modes parallel the movements of individuals driving those vehicles, which may classify those data as personal data under laws such as the California Consumer Privacy Act (CCPA). To mitigate potential privacy concerns, data required to be generated based on freight data standards should be use-case specific and seek to minimize data requested. USDOT can also play a leadership role in defining data retention limits. If specific use-cases ultimately include personal data, USDOT can also play a role in defining best practices and supporting data producers and consumers in navigating compliance protocols.

The private sector may also have concerns about generating data that may be business sensitive. Through uniform data production requirements and providing clarity on data licensure and technical considerations, such as tokenization, USDOT can alleviate concerns by creating an equal playing field. City governments utilized a similar approach of uniform data requirements to facilitate the production of data built to the General Bikeshare Feed Specification from micromobility companies.

Finally, leveraging data for business-critical operations and processes presents inherent business and potentially public or national security risks from bad actors. USDOT can demonstrate leadership through defining best practices and educating stakeholders on how to manage and mitigate data security risks.

Create space for the private sector to innovate. The development and adoption of open data standards instead creates an opportunity for the private sector to develop products that meet the

needs of operators and intermodal facilities across the world. This may include emerging technologies such as machine learning, artificial intelligence applications, and blockchain. Stakeholders should be empowered to license and purchase software products that meet the specific needs of their businesses.

Additionally, there is opportunity for government to lead by example with greater investment in streamlining business to government (B2G) systems and data protocols for permitting, reporting, and billing with better data sharing and user-friendly interfaces. This is an area to pursue potential public/private partnerships with governmental entities to transform their systems portfolios at the federal level, improve the fragmented permitting and fee-related processes at the state level, and increase regional integration for multi-state trips.

Define use-cases for governmental data access. The development of open standards to drive system efficiency should be the top priority. However, USDOT and state governments may also wish to access data to measure system efficiency, incentivize increased efficiency, and measure or manage progress towards specific public interest goals. USDOT should seek to define its potential use-cases for governmental data access and work with the neutral standards development bodies and industry to seek to define which data should be available to non-operational governments.

Empower intermodal facilities to have the ability to require the provision of data. Additionally, USDOT should seek to empower ports or other intermodal facilities to require the generation of data to open standard specifications. Facilities should in turn also generate data built to open standard specifications and make those data available to operators who utilize their facilities.

B. USDOT Should Use Subsidies to Achieve Digital Transformation Outcomes.

Freight digital transformation will require investment in hardware, data architecture, and software across the freight value chain. USDOT is positioned to catalyze such a transformation through expanded eligibility of pre-existing grants and the development of grant programs specifically aimed at these types of investments.

The 2015 Fixing America's Surface Transportation (FAST) Act made meaningful strides in supporting freight through increasing emphasis on the national freight network. Yet, the pre-existing programs are insufficient to support the U.S. in realizing the benefits of freight digital transformation. For example, pre-existing grant programs such as the INFRA or FASTLANE grants have eligibility requirements that require small projects to be at least \$5 million, limiting their utility for digital transformation projects.

Recommendations for USDOT

Expand eligibility of pre-existing grant programs. The Port Infrastructure Development Program (PIDP) grant can potentially be a funding mechanism for freight digital transformation. USDOT can amend program eligibility to explicitly encourage digital infrastructure investment.

Grant projects that include hardware, data architecture, and software supporting digital transformation should be included in program eligibility. Similarly, the Federal Rail Administration's Consolidated Rail Infrastructure and Safety Improvements (CRISI) grant program may also have similar opportunities for expanded eligibility.

Develop a digital transformation grant program. USDOT should develop a grant program aimed at funding digital transformation pilot projects. The project should require the utilization or continued development of open data standards as well as an assessment of efficiency gains and avoided carbon emissions impacts. Programs such as the Federal Transit Administration's Integrated Mobility Innovation grants can be used as a model for catalyzing innovative digital technology solutions.

C. USDOT Should Help Agencies and Authorities Play a Convening Role.

It will take broad collaboration to make this transition happen. Developing open standards is the first step but driving universal or widespread adoption will be an even greater challenge. USDOT can bring diverse voices to the table and establish incentive structures that foster long term collaboration. CFM has started this work through our global, collaborative research and policy development, but implementation at the federal and state level needs broad participation and strong leadership. USDOT is positioned to participate in both the international conversations happening abroad and, within the United States, to convene and provide guidance for state and local partners to achieve implementation success.

At the international level, USDOT should collaborate with other governments making progress in this space, such as the European Union, Singapore, and Australia. Identifying applicable best practices from other jurisdictions in spaces such as rail investment and inland waterways, and how the dynamics of different port ownership models affect successful digitalization efforts, can help to drive global alignment and understanding.

At the state and local level, USDOT should consider how to bolster existing requirements, such as state freight plans, to ensure sufficient progress on the digital side of freight infrastructure. These targeted state freight plans should be focused on helping each states' ports and intermodal facilities to successfully implement the national digitalization and data targets identified by the federal advisory panel and USDOT. There is also opportunity to ensure adherence to data standards by working with state and local level partners to set realistic goals and plan incentives for adoption in consultation with local authorities and stakeholders.

D. USDOT Should Ensure Digital Transformation Does Not Leave Smaller Firms and Owner-Operators Behind.

The freight sector includes firms of all sizes, from international enterprises with multimodal fleets to individual owners operating a single truck. A significant barrier to digital transformation at smaller firms is the capital to invest in new digital systems. The disparities in technology

adoption by medium and small companies create wide disconnects in the supply chain. The federal government can help small- and medium-sized operators, ports, and other stakeholders access digital tools through targeted investment support, ensuring that the benefits of data be shared across the system.

‘Mom and pop’ operators would benefit enormously from simple digital tools – with upgraded hardware and data processing capabilities, the increased efficiency of their operations would add value to the overall network. Absent federal intervention, digital transformation will likely continue in a lopsided manner, allowing a few large, technologically sophisticated firms to effectively crowd out smaller players. With a focus on targeted IT grants and loans for medium and small size logistics businesses, USDOT can bring the interests of smaller firms to the table, closing the digital divide, and move the entire sector toward more efficient, collaborative practices. Even a basic amount of data available to *all* stakeholders in standardized formats would transform operations, give all players access to better logistics planning abilities, and spur innovation.

VI. CONCLUSION

CFM appreciates the opportunity to provide comments in this proceeding. As described above, the time is right for USDOT to take an active role in promoting the digital transformation of the nation’s freight sector. CFM looks forward to working with USDOT in the months and years ahead on this important issue.

Sincerely,

/s/ Rachel Aland

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